

WHAT IS CLAIMED IS:

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1. Computer-executable process steps to provide an application programming interface (API),
5 the application programming interface providing a common interface between an application program and plural different types of color measuring devices each having at least one color measuring sensor, the computer-executable process steps comprising plural functions for operating any of the plural different types of color measuring devices, wherein in order to complete an operation performed by at least one of the plural functions, the function that performs the operation must be called a number of times which
10 is different for at least two different types of color measuring devices, and wherein for a color measuring device that is being operated, the API provides the application program with flow control data of the number of times that the function must
15 be called.

2. Computer-executable process steps according to Claim 1, wherein the flow control data is provided by the function which must be called the
25 number of times in order to complete the operation.

3. Computer-executable process steps according to Claim 2, wherein the flow control data is provided in the form of a call-again value.

30 4. Computer-executable process steps according to Claim 2, wherein the flow control data is provided in the form of a numerical value.

35 5. Computer-executable process steps according to Claim 1, wherein the flow control data is provided by a separate function other than the

function which must be called the number of times in order to complete the operation.

6. Computer-executable process steps
5 according to Claim 1, wherein functions in the API provide the application program with display values which are different for at least two different types of color measuring devices, the display values for display to a user so as to instruct the user in
10 manipulating the color measuring device that is being operated.

7. Computer-executable process steps
15 according to Claim 6, wherein the plural functions for operating any of the plural different types of color measuring devices further comprise:

20 a calibrate-position function to calibrate a relative position of a recording medium with respect to any of the plural different types of color measuring devices;

a calibrate-sensor function to calibrate any of the color measuring sensors of any of the plural different types of color measuring devices;

25 a move-to-patch function to relatively position any of the color measuring sensors and a color patch for any of the plural different types of color measuring devices, the move-to-patch function being provided with a logical color patch number by the application program; and

30 a make-measurement function to make a color measurement of the patch at which any of the color measuring sensors is relatively positioned, the make-measurement function providing the application program with a color measurement value for the color patch.
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8. Computer-executable process steps to provide an application programming interface (API), the API providing a common interface between an application program and plural different types of color measuring devices each having at least one color measuring sensor, the computer-executable process steps comprising plural functions for operating any of the plural different types of color measuring devices, the plural functions comprising:

10 a calibrate-position function to calibrate a relative position of a recording medium with respect to any of the plural different types of color measuring devices;

15 a calibrate-sensor function to calibrate any of the color measuring sensors of any of the plural different types of color measuring devices;

20 a move-to-patch function to relatively position any of the color measuring sensors and a color patch for any of the plural different types of color measuring devices, the move-to-patch function being provided with a logical color patch number by the application program; and

25 a make-measurement function to make a color measurement of the patch at which any of the color measuring sensors is relatively positioned, the make-measurement function providing the application program with a color measurement value for the color patch;

30 wherein in order to complete an operation performed by at least one of the plural functions, the function that performs the operation must be called a number of times which is different for at least two different types of color measuring devices, and wherein for a color measuring device that is being operated, the API provides the application program with flow control data of the number of times that the function must be called.

9. Computer-executable process steps according to Claim 8, wherein the calibrate-position function provides the application program with at least one display value that is to be displayed so as to instruct a user to position the recording medium or to position any of the color measuring sensors.

10 10. Computer-executable process steps according to Claim 8, wherein the calibrate-sensor function provides the application program with at least one display value that is to be displayed so as to instruct the user in calibrating the sensor.

15 11. Computer-executable process steps according to Claim 8, wherein the move-to-patch function causes the color measuring device to move any of the color measuring sensors so as to relatively position any of the color measuring sensors and the color patch.

20 25 12. Computer-executable process steps according to Claim 8, wherein the move-to-patch function provides the application program with at least one display value that is to be displayed so as to instruct the user to manipulate any of the color measuring devices so as to relatively position any of the color measuring sensors and the color patch.

30 35 13. Computer-executable process steps according to Claim 8, wherein the move-to-patch function causes the color measuring device to move the recording medium so as to relatively position any of the color measuring sensors and the color patch.

14. Computer-executable process steps
according to Claim 8, wherein the move-to-patch
function provides the application program with at
least one display value that is to be displayed so
as to instruct the user to move the recording medium
so as to relatively position any of the color
measuring sensors and the color patch.

10 15. Computer-executable process steps
according to Claim 8, wherein the move-to-patch
function provides the application program with a
recalibrate value in a case that the relative
position of the recording medium needs to be
recalibrated.

15 16. Computer-executable process steps
according to Claim 8, wherein the make-measurement
function provides the application program with at
least one display value that is to be displayed so
as to instruct the user in making the color
measurement.

20 25 17. Computer-executable process steps
according to Claim 8, wherein the make-measurement
function further provides the application program
with a recalibrate value in a case that any of the
color measuring sensors needs to be recalibrated.

30 18. Computer-executable process steps
according to Claim 8, wherein the flow control data
is provided by the function which must be called the
number of times in order to complete the operation.

35 19. Computer-executable process steps
according to Claim 18, wherein the flow control data
is provided in the form of a call-again value.

20. Computer-executable process steps according to Claim 18, wherein the flow control data is provided in the form of a numerical value.

5 21. Computer-executable process steps according to Claim 8, wherein the plural functions further comprise a get-device-capabilities function to provide the application program with the flow control data.

10 22. Computer-executable process steps according to Claim 8, wherein the plural functions in the API call device driver functions for the plural different types of color measuring devices.

15 23. Computer-executable process steps according to Claim 8, wherein the computer-executable process steps are stored in a dynamically linkable library.

20 24. Computer-executable process steps according to Claim 8, wherein the plural different types of color measuring devices include XY tables and hand-held patch readers.

25 25. Computer-executable process steps according to Claim 8, wherein the plural different types of color measuring devices include spectrometers and densitometers.

30 26. Computer-executable process steps according to Claim 8, wherein the application program is a color calibration program.

35 27. Computer-executable process steps to provide an application programming interface (API), the API providing a common interface between an

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application program and plural different types of color measuring devices each having at least one color measuring sensor, the computer-executable process steps comprising plural functions for operating any of the plural different types of color measuring devices, the plural functions comprising:

a calibrate-position function to calibrate a relative position of a recording medium with respect to any of the plural different types of color measuring devices, the calibrate-position function providing the application program with a position-calibration display value that, is to be displayed so as to instruct a user to position the recording medium or to position any of the color measuring sensors;

a calibrate-sensor function to calibrate any of the color measuring sensors of any of the plural different types of color measuring devices, the calibrate-sensor function providing the application program with a sensor-calibration display value to the application program, the sensor-calibration display value to be displayed so as to instruct the user in calibrating any of the color measuring sensors

a move-to-patch function to relatively position any of the color measuring sensors and a color patch for any of the plural different types of color measuring devices, the move-to-patch function being provided with a logical color patch number by the application program, providing the application program with a call-again value in a case that the move-to-patch function needs to be called multiple times to complete the relative positioning of the color measuring sensors and has not yet been called the multiple times, and providing the application program with a move-to-patch display value that is

to be displayed so as to instruct the user in
positioning any of the color measuring sensors; and
a make-measurement function to make a color
measurement of the patch at which any of the color
measuring sensors is relatively positioned, the
make-measurement function providing the application
program with a color measurement value for the color
patch, providing the application program with a
call-again value in a case that the make-measurement
function needs to be called multiple times to
complete making the color measurement of the color
patch and has not yet been called the multiple
times, and providing the application program with a
measurement display value that is to be displayed so
as to instruct the user in making the color
measurement.

28. Computer-executable process steps
according to Claim 27, further comprising a get-
device-capabilities function to provide the
application program with a number of times that the
calibrate-position function needs to be called so as
to calibrate the relative position of the recording
medium and to provide the application program with a
number of times that the calibrate-sensor function
needs to be called so as to calibrate any of the
color measuring sensors.

29. Computer-executable process steps
according to Claim 27, wherein the calibrate-
position function further provides the application
program with a number of times that the calibrate-
position function needs to be called so as to
calibrate the relative position of the recording
medium.

5 30. Computer-executable process steps according to Claim 27, wherein the calibrate-position function further provides the application program with a call-again value in a case that the calibrate-position function needs to be called multiple times so as to calibrate the relative position of the recording medium and has not yet been called the multiple times.

10 31. Computer-executable process steps according to Claim 27, wherein the calibrate-sensor function further provides the application program with a number of times that the calibrate-sensor function needs to be called so as to calibrate any 15 of the color measuring sensors.

20 32. Computer-executable process steps according to Claim 27, wherein the calibrate-sensor function further provides the application program with a call-again value in a case that the calibrate-sensor function needs to be called multiple times so as to calibrate any of the color 25 measuring sensors and has not yet been called the multiple times.

30 33. Computer-executable process steps according to Claim 27, wherein the move-to-patch function causes the color measuring device to move the sensor so as to relatively position any of the color measuring sensors and the color patch.

35 34. Computer-executable process steps according to Claim 27, wherein the move-to-patch display value instructs the user to manipulate any of the color measuring devices so as to relatively position any of the color measuring sensors and the color patch.

5 35. Computer-executable process steps according to Claim 27, wherein the move-to-patch function causes any of the color measuring devices to manipulate any of the color measuring devices so as to relatively position any of the color measuring sensors and the color patch.

10 36. Computer-executable process steps according to Claim 27, wherein the move-to-patch display value instructs the user to manipulate any of the color measuring devices so as to relatively position any of the color measuring sensors and the color patch.

15 37. Computer-executable process steps according to Claim 27, wherein the move-to-patch function further provides the application program with a recalibrate value in a case that the relative position of the recording medium needs to be
20 recalibrated.

25 38. Computer-executable process steps according to Claim 27, wherein the make-measurement function further provides the application program with a recalibrate value in a case that any of the color measuring sensors needs to be recalibrated.

30 39. Computer-executable process steps according to Claim 27, wherein functions in the API call device driver function for the different types of color measuring devices.

35 40. Computer-executable process steps according to Claim 27, wherein the computer-executable process steps are stored in a dynamically linkable library.

41. Computer-executable process steps according to Claim 27, wherein the plural different types of color measuring devices include XY tables and hand-held patch readers.

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42. Computer-executable process steps according to Claim 27, wherein the plural different types of color measuring devices include spectrometers and densitometers.

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43. Computer-executable process steps according to Claim 27, wherein the application program is a color calibration program.

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44. A dynamically linkable library (DLL) for making color measurements with any of plural different types of color measuring devices each having at least one color measuring sensor, the DLL comprising plural functions each of which is for operating any of the plural different types of color measuring devices, the plural functions comprising:

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a calibrate-position function to calibrate a relative position of a recording medium with respect to any of the plural different types of color measuring devices;

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a calibrate-sensor function to calibrate any of the color measuring sensors of any of the plural different types of color measuring devices;

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a move-to-patch function to relatively position any of the color measuring sensors and a color patch for any of the plural different types of color measuring devices, the move-to-patch function being provided with a logical color patch number; and

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a make-measurement function to make a color measurement of the patch at which any of the color measuring sensors is relatively positioned, the

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make-measurement function providing a color measurement value for the color patch;

wherein in order to complete an operation performed by at least one of the plural functions, the function that performs the operation must be called a number of times which is different for at least two different types of color measuring devices, and wherein for a color measuring device that is being operated, the DLL provides flow control data of the number of times that the function must be called.

45. A color calibration program, the color calibration program comprising computer-executable process steps to calibrate color fidelity of a color printer based on color measurements made by a color measuring device of color patches printed on a recording medium by the color printer, the computer-executable process steps comprising:

code to generate print data for the color patches;

code to send the print data to the color printer so as to print the color patches on the recording medium;

code to make color measurements of the color patches printed on the recording medium using any of plural different types of color measuring devices, the code to make color measurements calling functions provided by an application programming interface (API) that provides a common interface to the plural different types of color measuring devices, the code to make color measurements using the common interface; and

code to calibrate the color fidelity of the color printer based on the color measurements.

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46. A computer-readable medium which stores computer-executable process steps, the computer-executable process steps to provide an application programming interface (API), the application programming interface providing a common interface between an application program and plural different types of color measuring devices each having at least one color measuring sensor, the computer-executable process steps comprising plural functions for operating any of the plural different types of color measuring devices, wherein in order to complete an operation performed by at least one of the plural functions, the function that performs the operation must be called a number of times which is different for at least two different types of color measuring devices, and wherein for a color measuring device that is being operated, the API provides the application program with flow control data of the number of times that the function must be called.

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47. A computer-readable medium according to Claim 46, wherein the flow control data is provided by the function which must be called the number of times in order to complete the operation.

48. A computer-readable medium according to Claim 47, wherein the flow control data is provided in the form of a call-again value.

49. A computer-readable medium according to Claim 47, wherein the flow control data is provided in the form of a numerical value.

50. A computer-readable medium according to Claim 46, wherein the flow control data is provided by a separate function other than the

function which must be called the number of times in order to complete the operation.

5 51. A computer-readable medium according to Claim 46, wherein functions in the API provide the application program with display values which are different for at least two different types of color measuring devices, the display values for display to a user so as to instruct the user in 10 manipulating the color measuring device that is being operated.

15 52. A computer readable medium according to Claim 51, wherein the plural functions for operating any of the plural different types of color measuring devices further comprise:

20 a calibrate-position function to calibrate a relative position of a recording medium with respect to any of the plural different types of color measuring devices;

a calibrate-sensor function to calibrate any of the color measuring sensors of any of the plural different types of color measuring devices;

25 a move-to-patch function to relatively position any of the color measuring sensors and a color patch for any of the plural different types of color measuring devices, the move-to-patch function being provided with a logical color patch number by the application program; and

30 a make-measurement function to make a color measurement of the patch at which any of the color measuring sensors is relatively positioned, the make-measurement function providing the application program with a color measurement value for the color patch.

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5 53. A computer readable medium storing
computer-executable process steps, the computer-
executable process steps to provide an application
programming interface (API), the API providing a
common interface between an application program and
plural different types of color measuring devices
each having at least one color measuring sensor, the
computer-executable process steps comprising plural
functions for operating any of the plural different
10 types of color measuring devices, the plural
functions comprising:

15 a calibrate-position function to calibrate
a relative position of a recording medium with
respect to any of the plural different types of
color measuring devices;

20 a calibrate-sensor function to calibrate
any of the color measuring sensors of any of the
plural different types of color measuring devices;

25 a move-to-patch function to relatively
position any of the color measuring sensors and a
color patch for any of the plural different types of
color measuring devices, the move-to-patch function
being provided with a logical color patch number by
the application program; and

30 a make-measurement function to make a color
measurement of the patch at which any of the color
measuring sensors is relatively positioned, the
make-measurement function providing the application
program with a color measurement value for the color
patch;

35 wherein in order to complete an operation
performed by at least one of the plural functions,
the function that performs the operation must be
called a number of times which is different for at
least two different types of color measuring
devices, and wherein for a color measuring device
that is being operated, the API provides the

application program with flow control data of the number of times that the function must be called.

5 54. A computer-readable medium according to Claim 53, wherein the calibrate-position function provides the application program with at least one display value that is to be displayed so as to instruct a user to position the recording medium or to position any of the color measuring sensors.

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15 55. A computer-readable medium according to Claim 53, wherein the calibrate-sensor function provides the application program with at least one display value that is to be displayed so as to instruct the user in calibrating the sensor.

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56. A computer-readable medium according to Claim 53, wherein the move-to-patch function causes the color measuring device to move any of the color measuring sensors so as to relatively position any of the color measuring sensors and the color patch.

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30 57. A computer-readable medium according to Claim 53, wherein the move-to-patch function provides the application program with at least one display value that is to be displayed so as to instruct the user to manipulate any of the color measuring devices so as to relatively position any of the color measuring sensors and the color patch.

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58. A computer-readable medium according to Claim 53, wherein the move-to-patch function causes the color measuring device to move the recording medium so as to relatively position any of the color measuring sensors and the color patch.

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5 59. A computer-readable medium according to Claim 53, wherein the move-to-patch function provides the application program with at least one display value that is to be displayed so as to instruct the user to move the recording medium so as to relatively position any of the color measuring sensors and the color patch.

10 60. A computer-readable medium according to Claim 53, wherein the move-to-patch function provides the application program with a recalibrate value in a case that the relative position of the recording medium needs to be recalibrated.

15 61. A computer readable medium according to Claim 53, wherein the make-measurement function provides the application program with at least one display value that is to be displayed so as to instruct the user in making the color measurement.

20 62. A computer-readable medium according to Claim 53, wherein the make-measurement function further provides the application program with a recalibrate value in a case that any of the color measuring sensors needs to be recalibrated.

25 63. A computer readable medium according to Claim 53, wherein the flow control data is provided by the function which must be called the number of times in order to complete the operation.

30 64. A computer readable medium according to Claim 63, wherein the flow control data is provided in the form of a call-again value.

65. A computer readable medium according to Claim 63, wherein the flow control data is provided in the form of a numerical value.

5 66. A computer-readable medium according to Claim 53, wherein the plural functions further comprise a get-device-capabilities function to provide the application program with the flow control data.

10 67. A computer-readable medium according to Claim 53, wherein the plural functions in the API call device driver functions for the plural different types of color measuring devices.

15 68. A computer-readable medium according to Claim 53, wherein the computer-executable process steps are stored in a dynamically linkable library.

20 69. A computer-readable medium according to Claim 53, wherein the plural different types of color measuring devices include XY tables and hand-held patch readers.

25 70. A computer-readable medium according to Claim 53, wherein the plural different types of color measuring devices include spectrometers and densitometers.

30 71. A computer-readable medium according to Claim 53, wherein the application program is a color calibration program.

35 72. A computer-readable medium storing computer-executable process steps, the computer-executable process steps to provide an application programming interface (API), the API providing a

common interface between an application program and plural different types of color measuring devices each having at least one color measuring sensor, the computer-executable process steps comprising plural functions for operating any of the plural different types of color measuring devices, the plural functions comprising:

5 a calibrate-position function to calibrate a relative position of a recording medium with respect to any of the plural different types of color measuring devices, the calibrate-position function providing the application program with a position-calibration display value that is to be displayed so as to instruct a user to position the recording medium or to position any of the color 10 measuring sensors;

15 a calibrate-sensor function to calibrate any of the color measuring sensors of any of the plural different types of color measuring devices, the calibrate-sensor function providing the application program with a sensor-calibration display value to the application program, the sensor-calibration display value to be displayed so as to instruct the user in calibrating any of the color 20 measuring sensors;

25 a move-to-patch function to relatively position any of the color measuring sensors and a color patch for any of the plural different types of color measuring devices, the move-to-patch function being provided with a logical color patch number by the application program, providing the application 30 program with a call-again value in a case that the move-to-patch function needs to be called multiple times to complete the relative positioning of the color measuring sensors and has not yet been called the multiple times, and providing the application 35 program with a move-to-patch display value that is

to be displayed so as to instruct the user in
positioning any of the color measuring sensors; and
a make-measurement function to make a color
measurement of the patch at which any of the color
measuring sensors is relatively positioned, the
make-measurement function providing the application
program with a color measurement value for the color
patch, providing the application program with a
call-again value in a case that the make-measurement
function needs to be called multiple times to
complete making the color measurement of the color
patch and has not yet been called the multiple
times, and providing the application program with a
measurement display value that is to be displayed so
as to instruct the user in making the color
measurement.

73. A computer-readable medium according
to Claim 72, further comprising a get-device-
capabilities function to provide the application
program with a number of times that the calibrate-
position function needs to be called so as to
calibrate the relative position of the recording
medium and to provide the application program with a
number of times that the calibrate-sensor function
needs to be called so as to calibrate any of the
color measuring sensors.

74. A computer-readable medium according
to Claim 72, wherein the calibrate-position function
further provides the application program with a
number of times that the calibrate-position function
needs to be called so as to calibrate the relative
position of the recording medium.

75. A computer-readable medium according
to Claim 72, wherein the calibrate-position function

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further provides the application program with a call-again value in a case that the calibrate-position function needs to be called multiple times so as to calibrate the relative position of the recording medium and has not yet been called the multiple times.

76. A computer-readable medium according to Claim 72, wherein the calibrate-sensor function further provides the application program with a number of times that the calibrate-sensor function needs to be called so as to calibrate any of the color measuring sensors.

77. A computer-readable medium according to Claim 72, wherein the calibrate-sensor function further provides the application program with a call-again value in a case that the calibrate-sensor function needs to be called multiple times so as to calibrate any of the color measuring sensors and has not yet been called the multiple times.

78. A computer-readable medium according to Claim 72, wherein the move-to-patch function causes the color measuring device to move the sensor so as to relatively position any of the color measuring sensors and the color patch.

79. A computer-readable medium according to Claim 72, wherein the move-to-patch display value instructs the user to manipulate any of the color measuring devices so as to relatively position any of the color measuring sensors and the color patch.

80. A computer-readable medium according to Claim 72, wherein the move-to-patch function causes any of the color measuring devices to

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manipulate any of the color measuring devices so as to relatively position any of the color measuring sensors and the color patch.

5 81. A computer-readable medium according to Claim 72, wherein the move-to-patch display value instructs the user to manipulate any of the color measuring devices so as to relatively position any of the color measuring sensors and the color patch.

10 82. A computer-readable medium according to Claim 72, wherein the move-to-patch function further provides the application program with a recalibrate value in a case that the relative 15 position of the recording medium needs to be recalibrated.

20 83. A computer-readable medium according to Claim 72, wherein the make-measurement function further provides the application program with a recalibrate value in a case that any of the color 25 measuring sensors needs to be recalibrated.

30 84. A computer-readable medium according to Claim 72, wherein functions in the API call device driver function for the different types of color measuring devices.

35 85. A computer-readable medium according to Claim 72, wherein the computer-executable process steps are stored in a dynamically linkable library.

35 86. A computer-readable medium according to Claim 72, wherein the plural different types of color measuring devices include XY tables and hand-held patch readers.

87. A computer-readable medium according to Claim 72, wherein the plural different types of color measuring devices include spectrometers and densitometers.

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88. A computer-readable medium according to Claim 72, wherein the application program is a color calibration program.

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89. A computer-readable medium storing a dynamically linkable library (DLL), the DLL for making color measurements with any of plural different types of color measuring devices each having at least one color measuring sensor, the DLL comprising plural functions each of which is for operating any of the plural different types of color measuring devices, the plural functions comprising:

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a calibrate-position function to calibrate a relative position of a recording medium with respect to any of the plural different types of color measuring devices;

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a calibrate-sensor function to calibrate any of the color measuring sensors of any of the plural different types of color measuring devices;

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a move-to-patch function to relatively position any of the color measuring sensors and a color patch for any of the plural different types of color measuring devices, the move-to-patch function being provided with a logical color patch number;

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and

a make-measurement function to make a color measurement of the patch at which any of the color measuring sensors is relatively positioned, the make-measurement function providing a color measurement value for the color patch;

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wherein in order to complete an operation performed by at least one of the plural functions,

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the function that performs the operation must be called a number of times which is different for at least two different types of color measuring devices, and wherein for a color measuring device that is being operated, the DLL provides flow control data of the number of times that the function must be called.

90. A computer-readable medium storing a color calibration program, the color calibration program comprising computer-executable process steps to calibrate color fidelity of a color printer based on color measurements made by a color measuring device of color patches printed on a recording medium by the color printer, the computer-executable process steps comprising:

code to generate print data for the color patches;

code to send the print data to the color printer so as to print the color patches on the recording medium;

code to make color measurements of the color patches printed on the recording medium using any of plural different types of color measuring devices, the code to make color measurements calling functions provided by an application programming interface (API) that provides a common interface to the plural different types of color measuring devices, the code to make color measurements using the common interface; and

code to calibrate the color fidelity of the color printer based on the color measurements.

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